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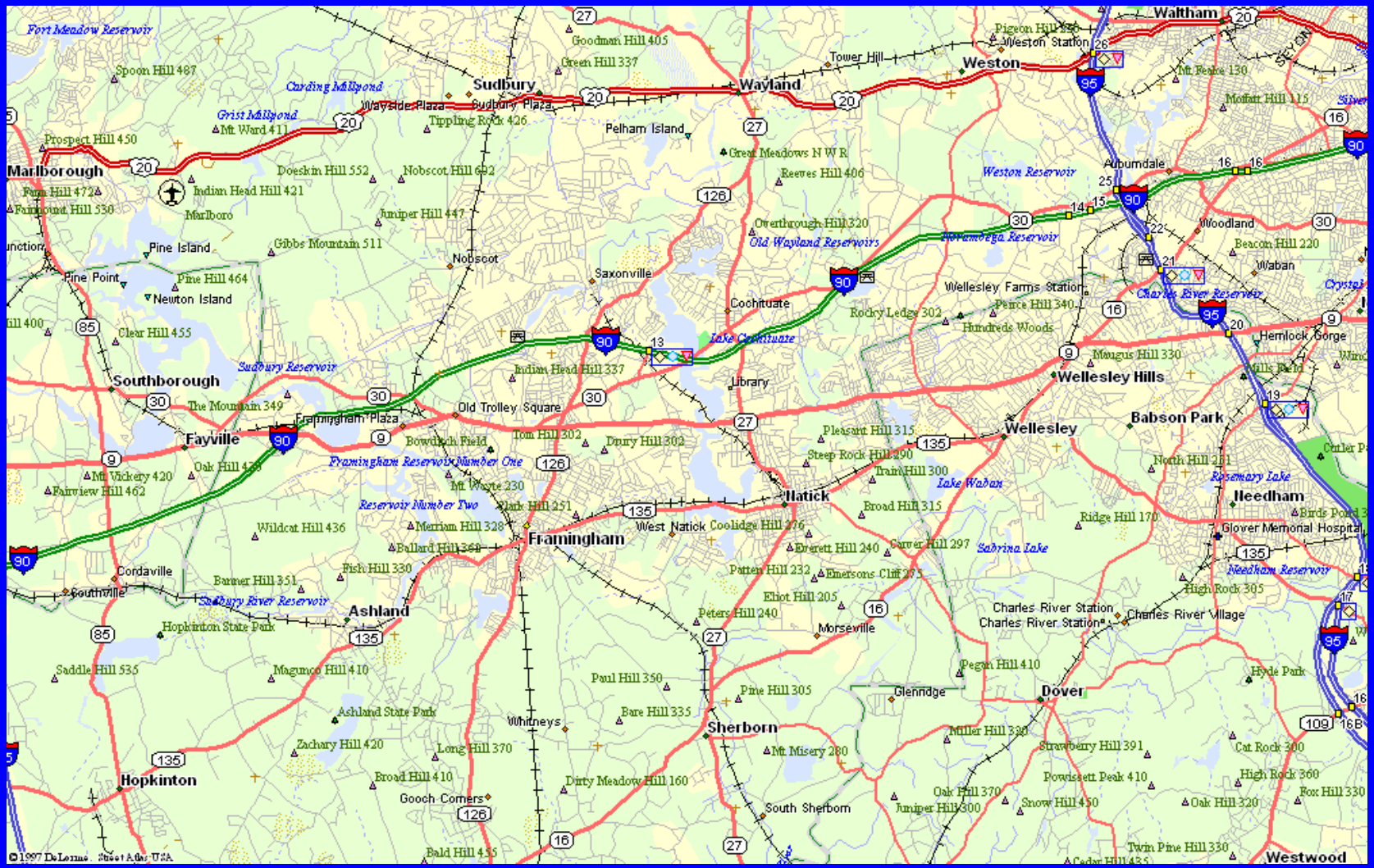

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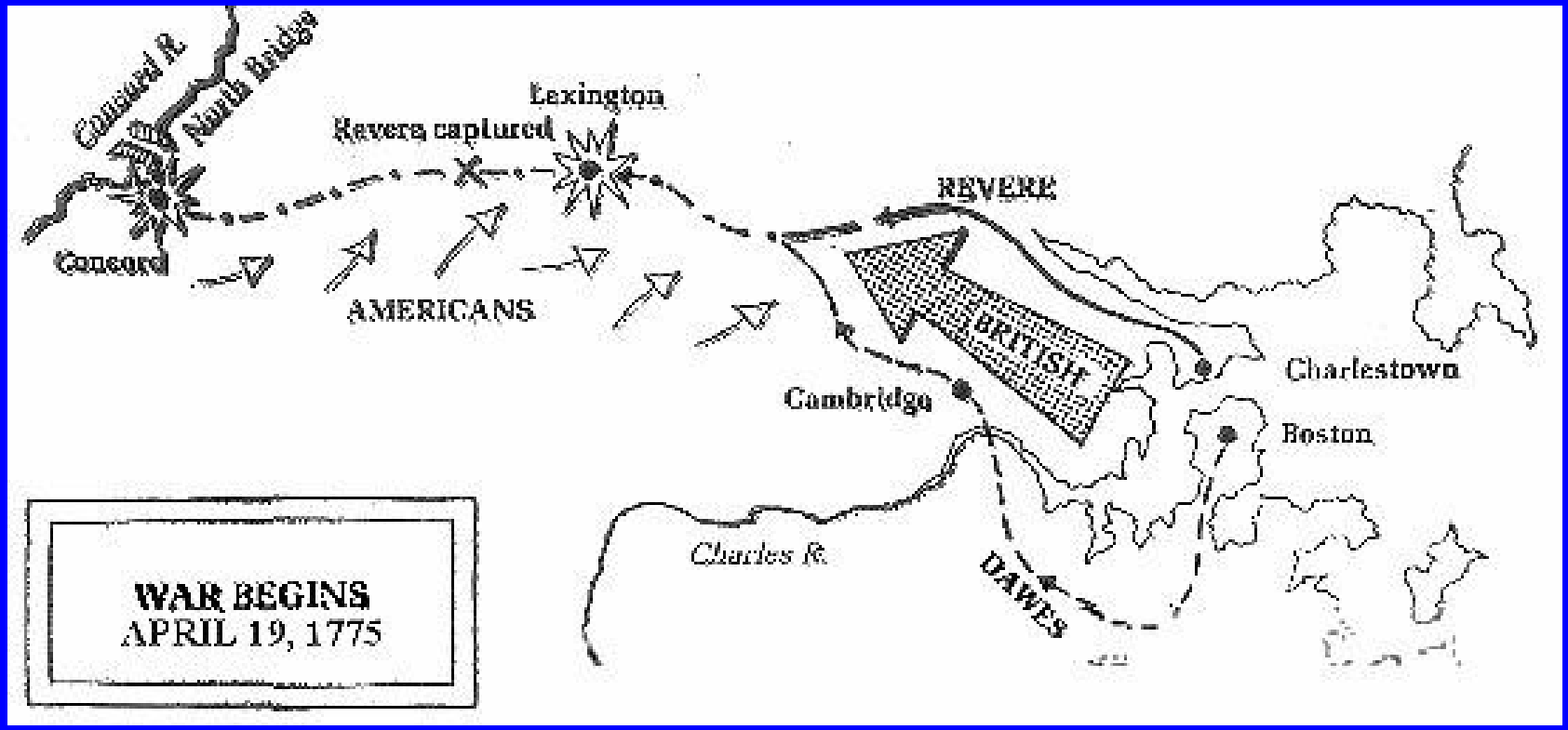

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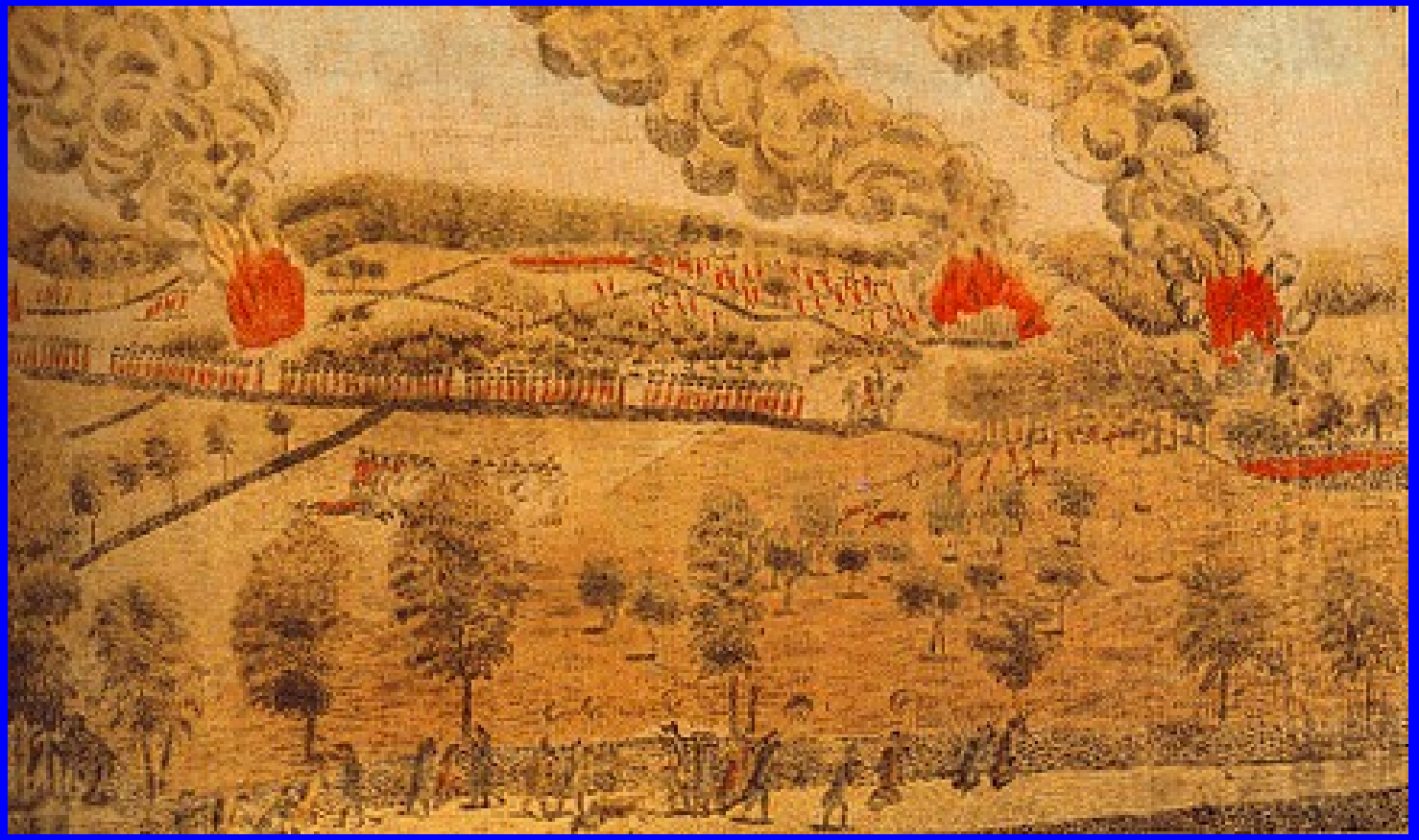

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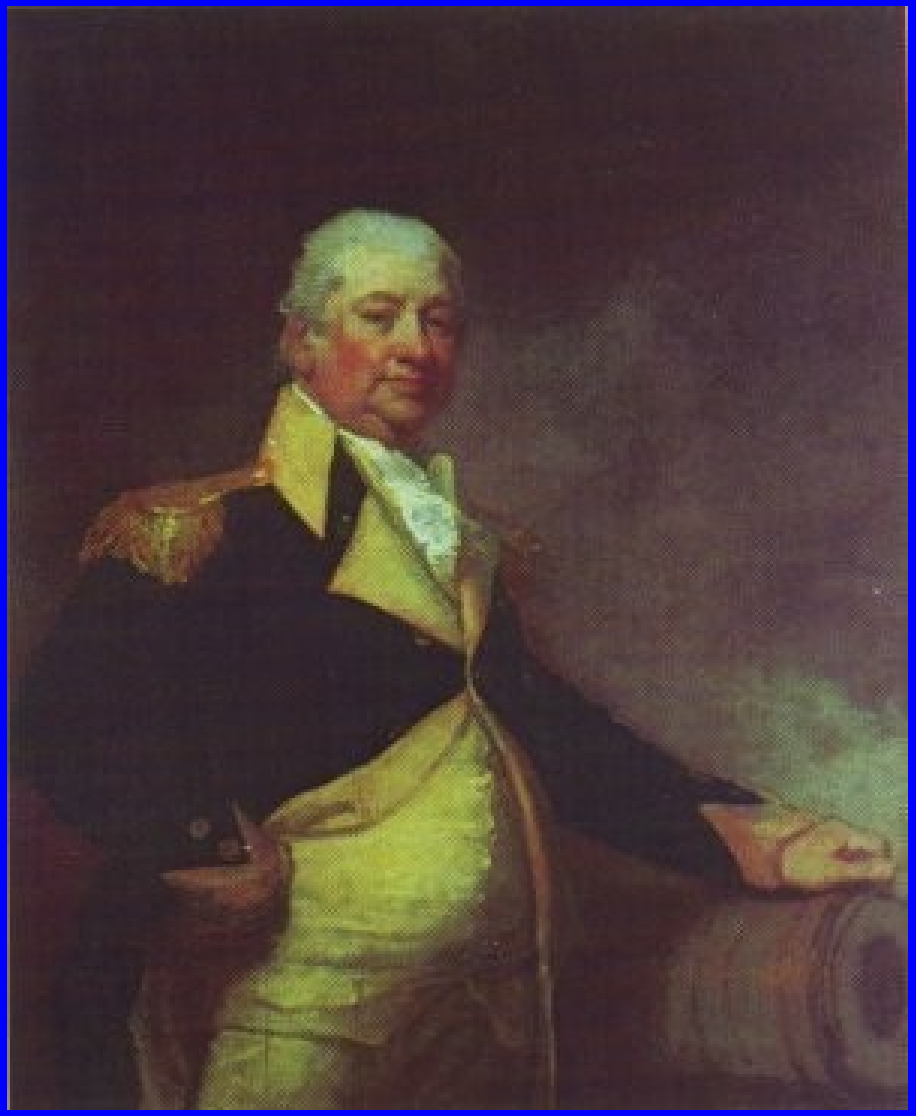

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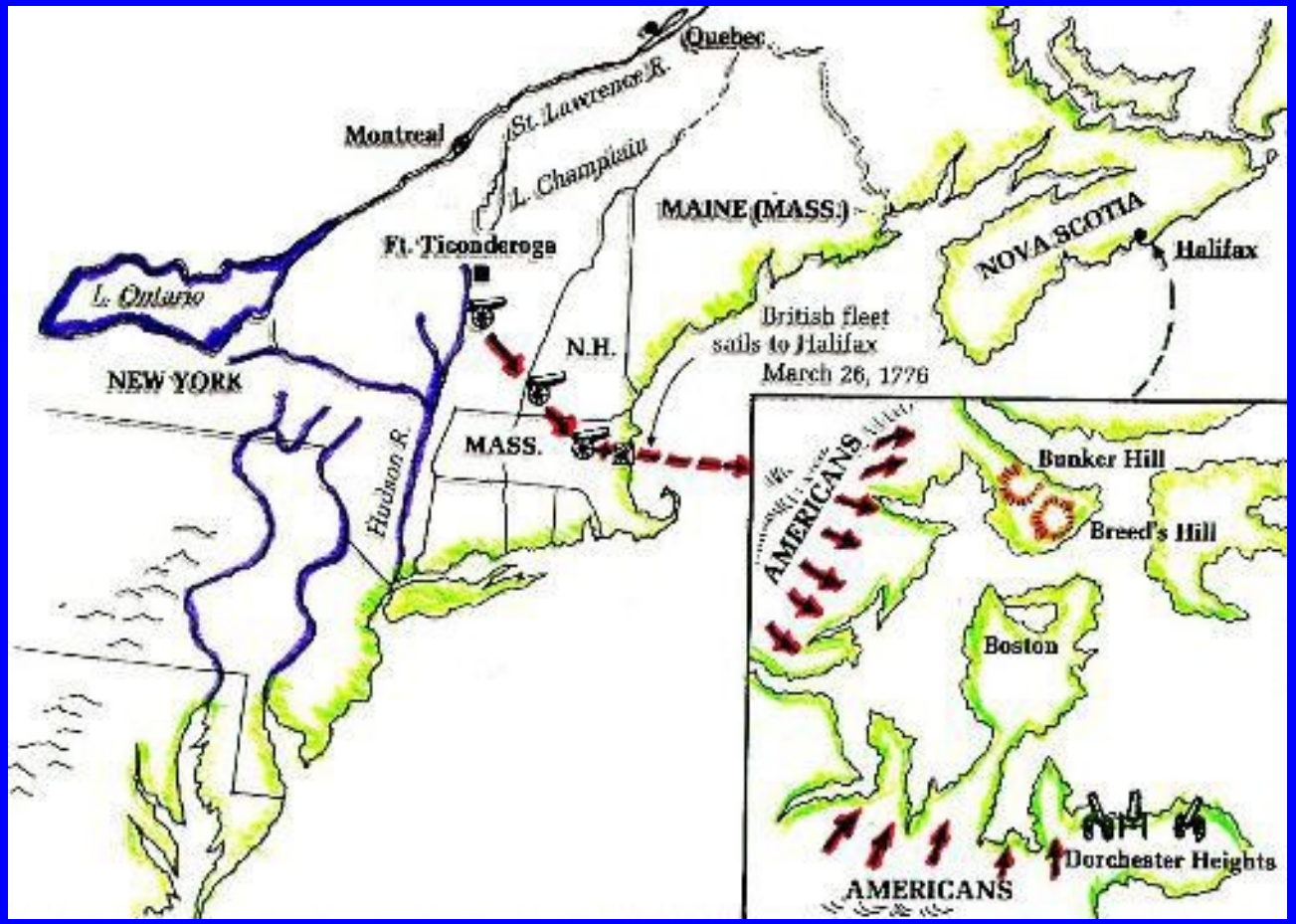

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"It is not big armies that win battles,
it is the good ones."

Maurice, Compte de Saxe
1696-1750
Marshall of the King of France

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Burr's Military Maxim

There's no such thing as an automatic weapon.

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Soldiers physiological and psychological limitations make them the most vulnerable part of the warfighting system.

FM 100-5 1995

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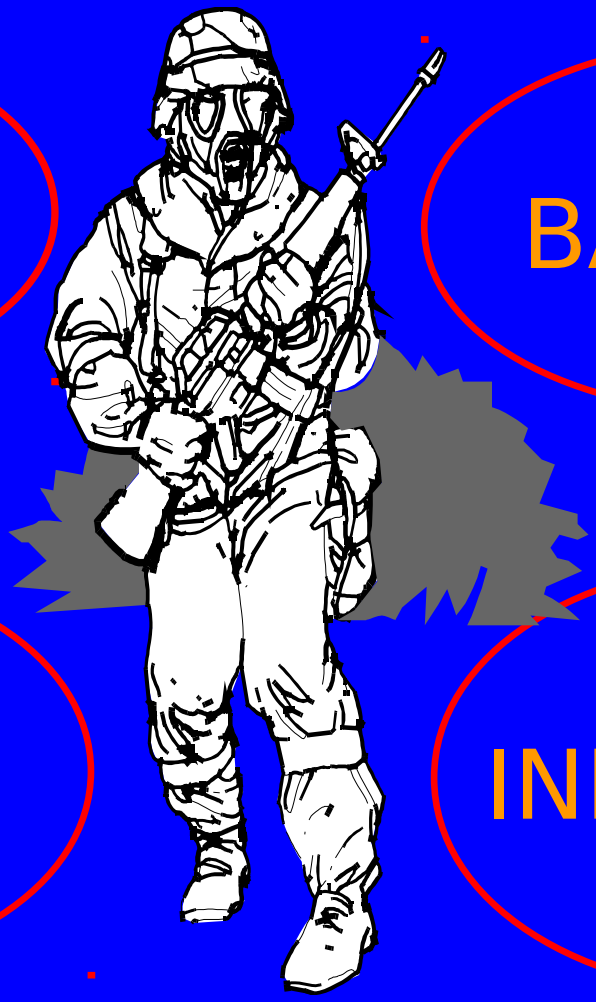
OPERATIONAL THREATS

CBR

BALLISTIC



OCC/ENV

INFECTIOUS

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Occupational - Environmental Stressors (Hazards)

- Environmental Toxins
- Time Constraints
- Limited Water Supply
- Heavy Physical Demands
- Heavy Psychological Demands
- Protective Uniforms
- Unfamiliar Environment
- Climatic Extremes
- Circadian Desynchronosis
- Nostalgia

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$$\text{Strain} = f\frac{\text{Time x Intensity (stressor)}}{\text{Resistance x Technology}}$$

$$\text{Disease} = f(\text{Strain})$$

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Weight Loss

Protective Uniform

Desynchronosis

Toxic

Climate

Anger

Grief

Fear

Load Carriage

Separation

Sleep Loss

Dehydration

CCEOM 1999

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Specific Consequences of Environmental Stressors: "**Strain**"

- Reduced Cognitive Capacity
  - Vigilance, Reaction Time, Tracking, Cognition, Perception
- Reduced Physical Capacity
- Adaptive and Maladaptive Effects of Stress
  - Psychological Arousal/Conditioning
  - Altered Immune Function

- Accidents and Injuries
- Clinical Illness

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Exposure	Outcome
Heat	MS Trauma
Physical Exertion	Heat Exhaustion
Chemical Hazards	Chemical Exposure
Time Demands	Myocardial Infarction
PPE	Accident

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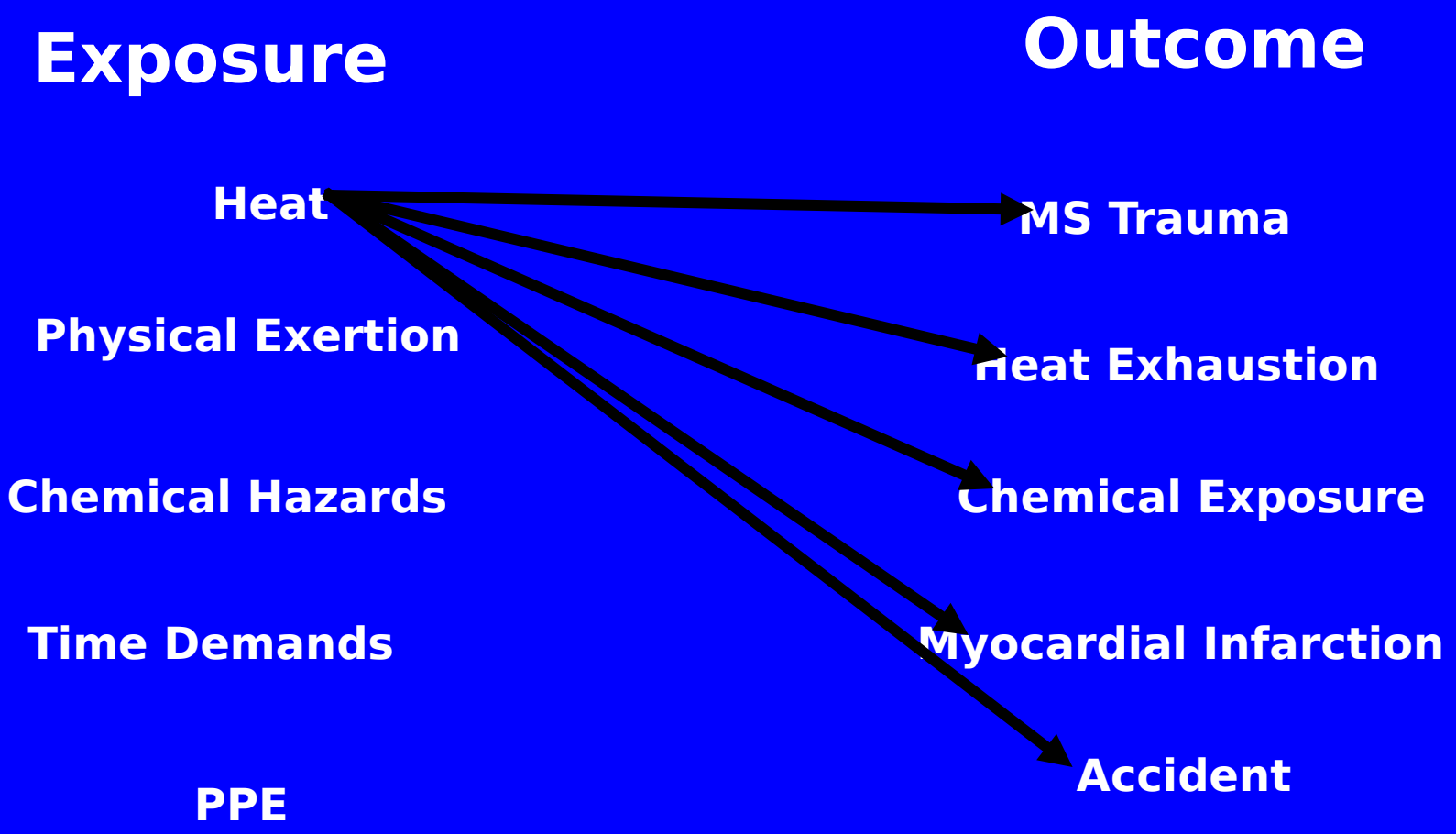

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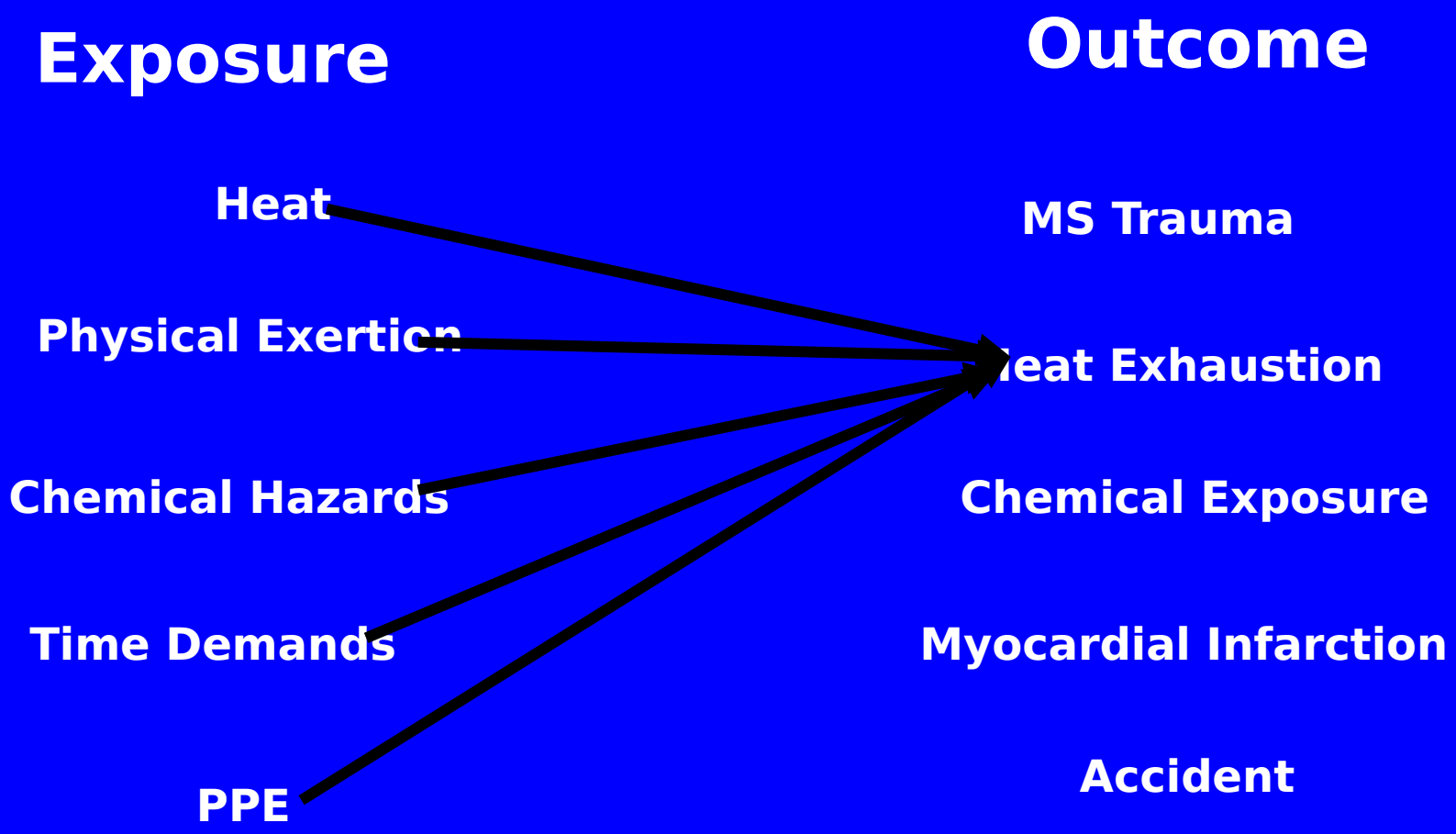

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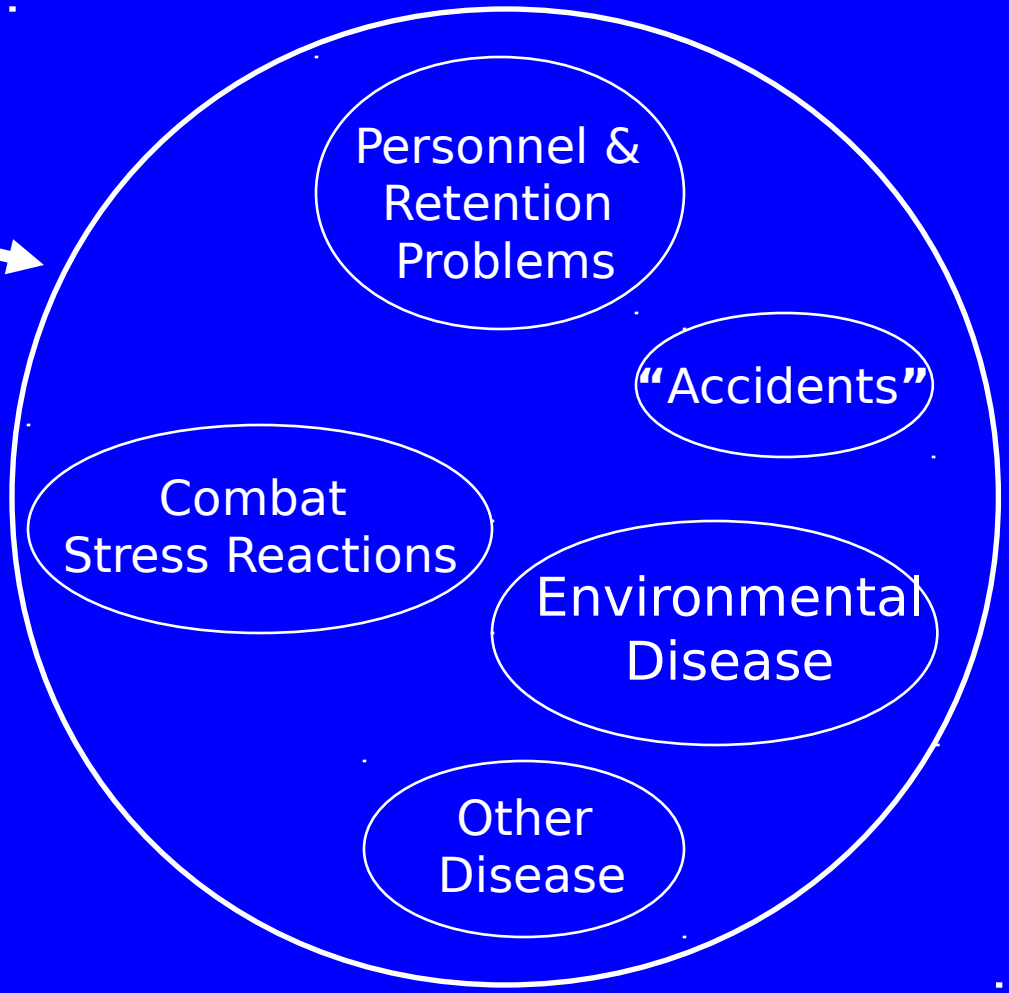
Spectrum of Operational Strain

Reduced Capability

Increased Susceptibility



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Stressors

Environmental Toxins
Time Constraints
Limited Water Supply
Heavy Physical Demands
Heavy Psychological Demands
Protective Uniforms
Unfamiliar Environment
Climatic Extremes
Circadian Desynchronosis
Nostalgia

Strain

PHYSICAL FATIGUE
EMOTIONAL FATIGUE
REDUCED HOST DEFENSE
COGNITIVE IMPAIRMENT
REDUCED PHYSICAL CAPACITY

REDUCED COMBAT EFFECTIVENESS

Military Consequence

CASUALTIES

Cycle of Operational Stress

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The Leading Idea

A corps of Medical officers was not established solely for the purpose of attending the wounded and sick; the proper treatment of these sufferers is certainly a matter of very great importance, and is an imperative duty, but the labors of Medical officers cover a more extended field. The **leading idea**, which should constantly be kept in view, is to strengthen the hands of the Commanding General by keeping his army in the most vigorous health, thus rendering it, in the highest degree, efficient for enduring fatigue and privation, and for fighting.

Dr. Jonathan Letterman, 1866

Medical Director, Army of the Potomac

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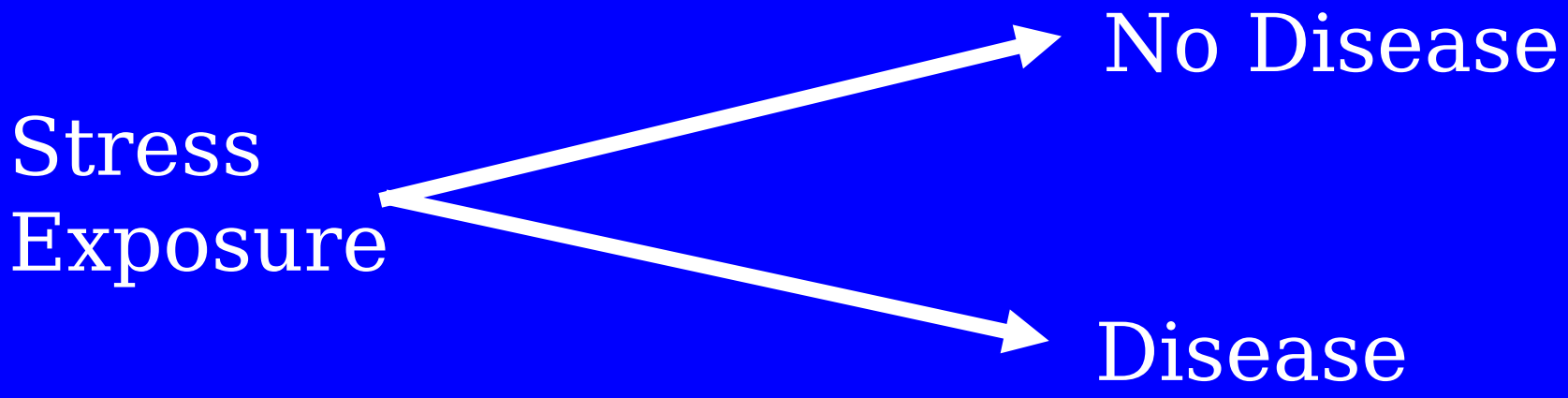
CLINICAL MODEL



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OPERATIONAL MODEL

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The Real Enemy

- "the real enemy was the weather and the side-effects of living rough." Denis Winter Death's Men

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Cold

We urinated into our numbed hands to warm them, and, hopefully, to cauterize the gaping cuts in our fingers. Some men had patches of skin on the tips of their noses that had frozen and becone infected. Similar infection was common in the folds of the eyelids, around the ears and particularly in the hands. I myself was not seriously affected, but each movement of my fingers opened and closed deep crevasses which oozed blood.

Guy Sajer, The Forgotten Soldier, 1971

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Cold and Wet

- "Started at 2:30 pm in pouring rain, along a pave' road. Thousands of passing lorries covered us all in mud. On arrival in the dark, soaked with mud and water and shivering with cold, we found the billets allotted to us were occupied by gunners.... Perpetual rain, everything grey, everyone soaked." 2LT John Glubb, WW1
- "Dampness rusts men like rifles, more slowly but more deeply." Henri Barbusse

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Heat

- "Blood, vomit and feces mixed with the mud made up a frightful compound which stuck to the boots in layers. A pair of shorts was the only possible uniform. Sweat poured constantly over the forehead and back, dripping from the armpits to the hands.... With those in plaster, sweat caused terrible skin irritations which developed into sores, discharging matter and making sleep out of the question." MAJ Paul Grauwin, Senior Medical Officer, Dien Bien Phu

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Load

"The men marched in long files, 10 yards apart so that a moving commando stretched across 5 miles of East Falkland. Even if they managed to dry their feet during the night, each morning within a few minutes they had squelched through a marsh in the darkness, waded a stream or merely endured a torrential rain shower. Their canvas webbing stiffened and shrank on their shoulders, their hair hung matted on their skulls, the strain of stumbling across the hillside with their grenades, weapons and linkbelt ammunition across their chests was etched into each face long before evening."

Hastings/Jenkins The Battle for the Falklands

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"A man would lean back in his trench as I spoke to him and become unconscious before my eyes. Another standing in his slit trench, fell asleep on his feet and slithered slowly to his knees, to finish huddled in the corner, still holding the mess-tin from which he had been eating as exhaustion overcame him."

LT Mc Dougall, 4 Commando, Normandy, 1944

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"For most of his time the average private was tired. fairly often he was so tired as no man at home ever is in the common run of his work. If a company's trench strength was low and sentry posts abounded more than usual in its sector, a man might, for eight days running, get no more than one hour off duty at any one time, day or night...." C E Montague, WW1

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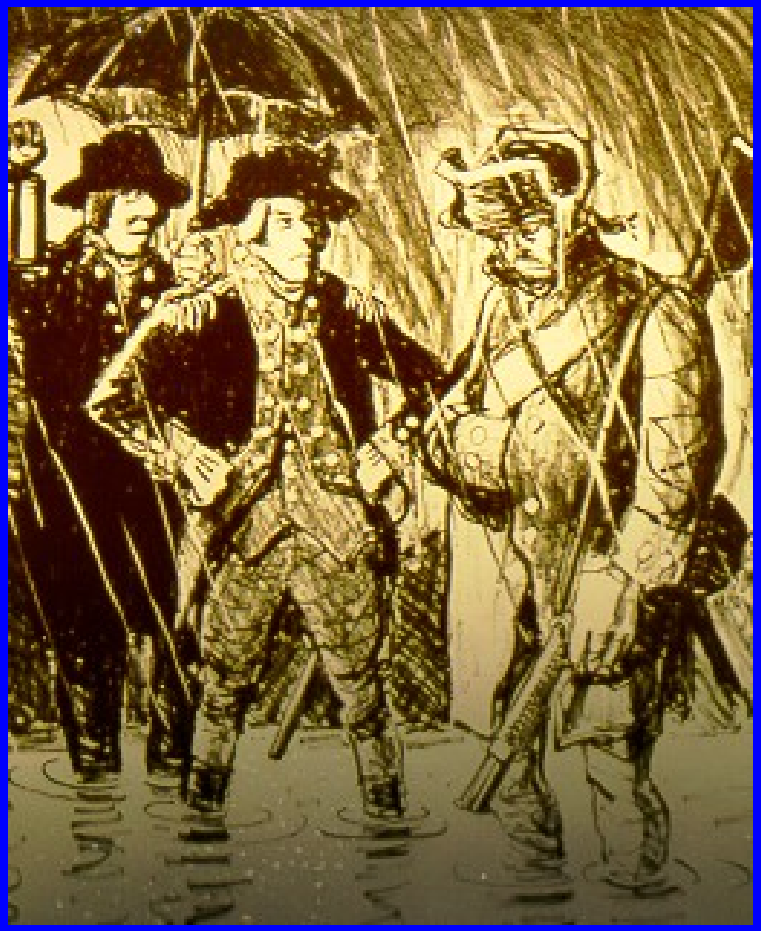

“Before you arrest him for sleeping on duty,
ask him how he does it.”

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Combat exhaustion may appear in a few as fifteen
or twenty days or in as many as forty or fifty days
One thing alone seems to be certain: Practical
all infantry soldiers suffer from a neurotic react
eventually if they are subjected to the stress of
modern combat continuously and long enough.

Swank and Marchand
Arch of Neurology and Psychiatry 1946; 55:236-247

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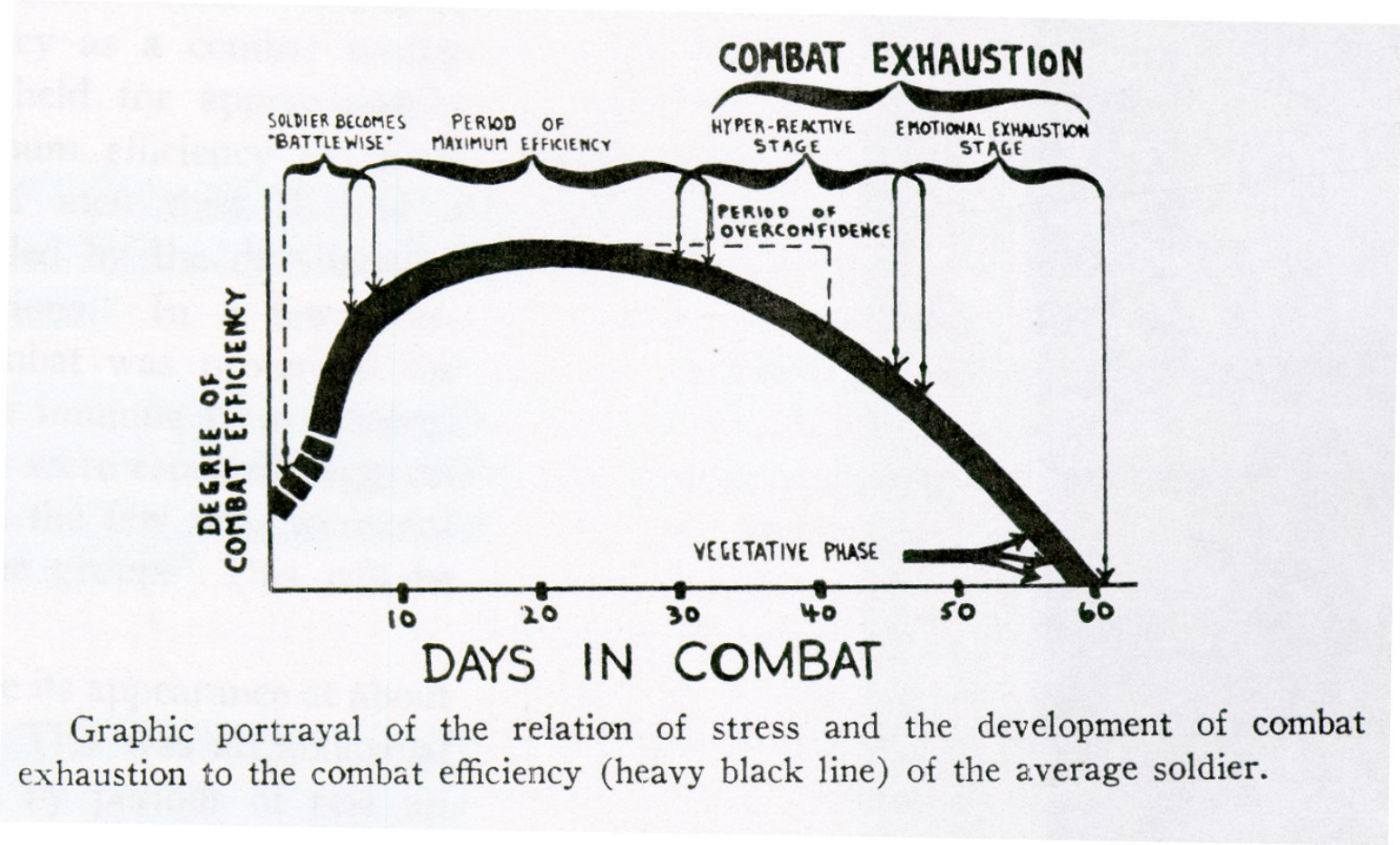

Graphic portrayal of the relation of stress and the development of combat exhaustion to the combat efficiency (heavy black line) of the average soldier.

Swank and Marchand
Arch of Neurology and Psychiatry 1946; 55:236-247

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Good doctors are no use without good discipline. More than half the battle against disease is fought, not by the doctors, but by the regimental officers.

General Slim

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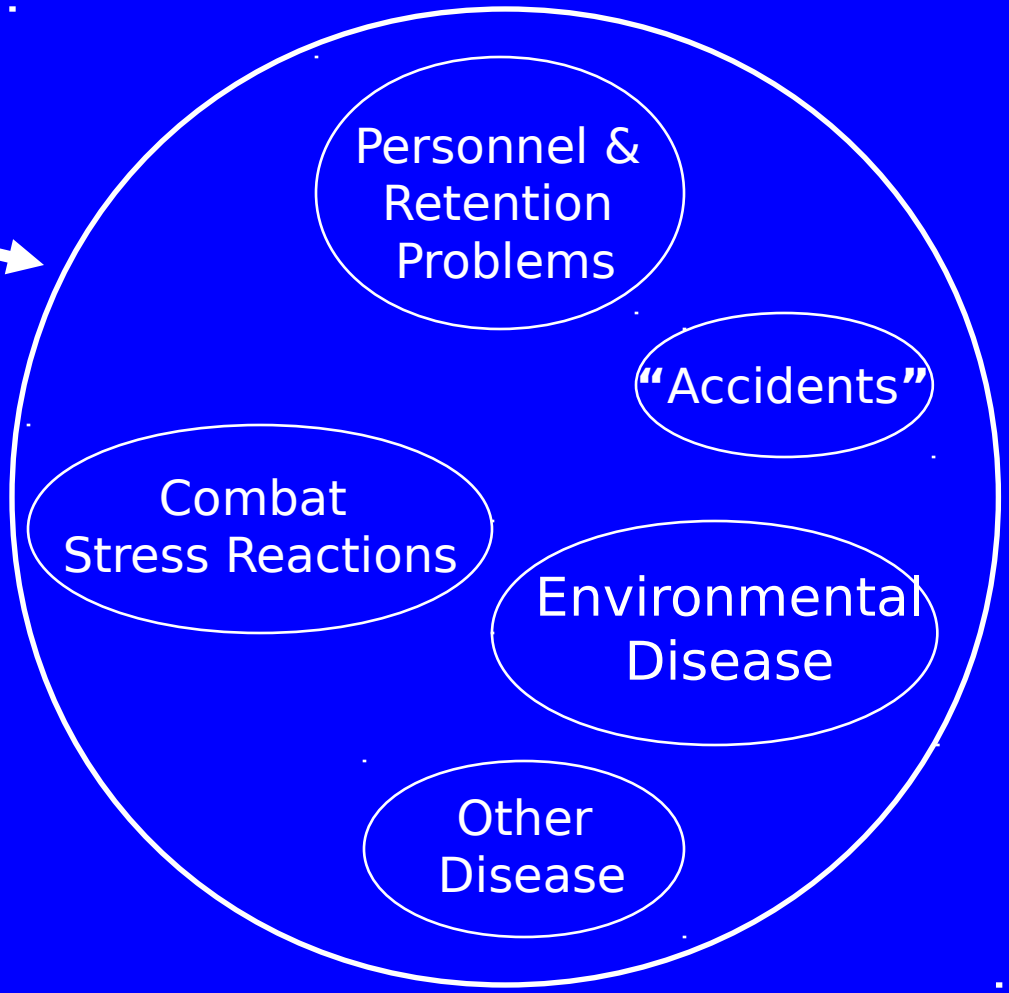
Spectrum of Operational Strain

Reduced Capability

Increased Susceptibility



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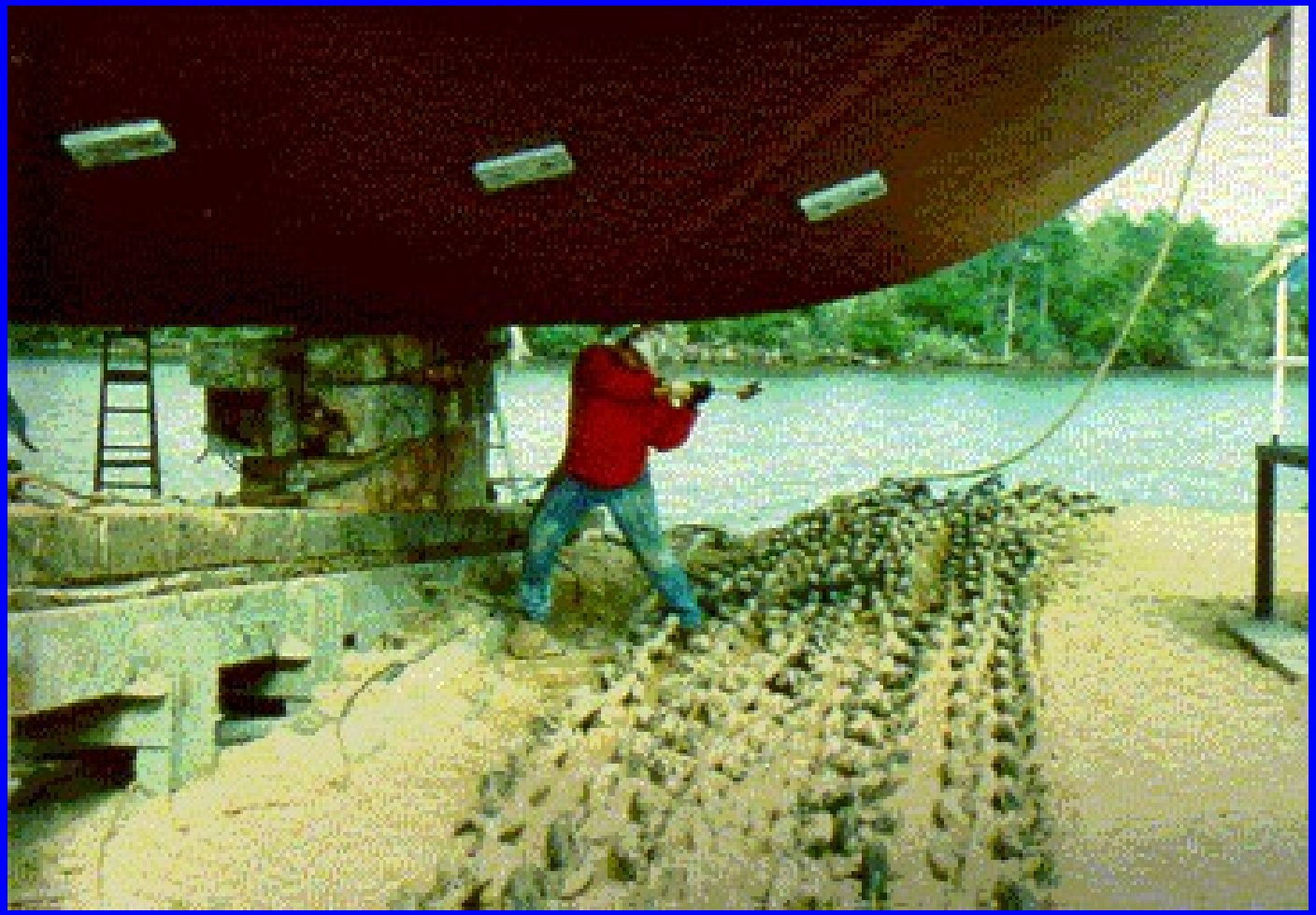

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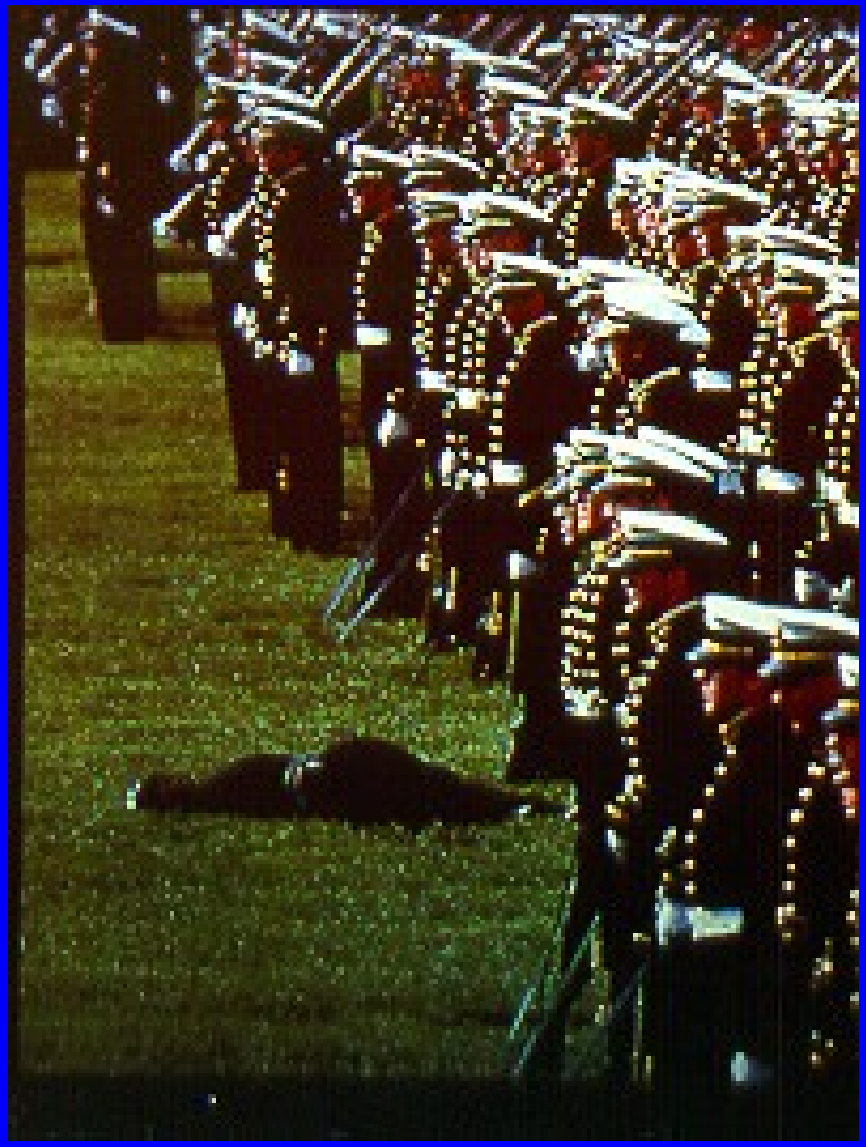

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